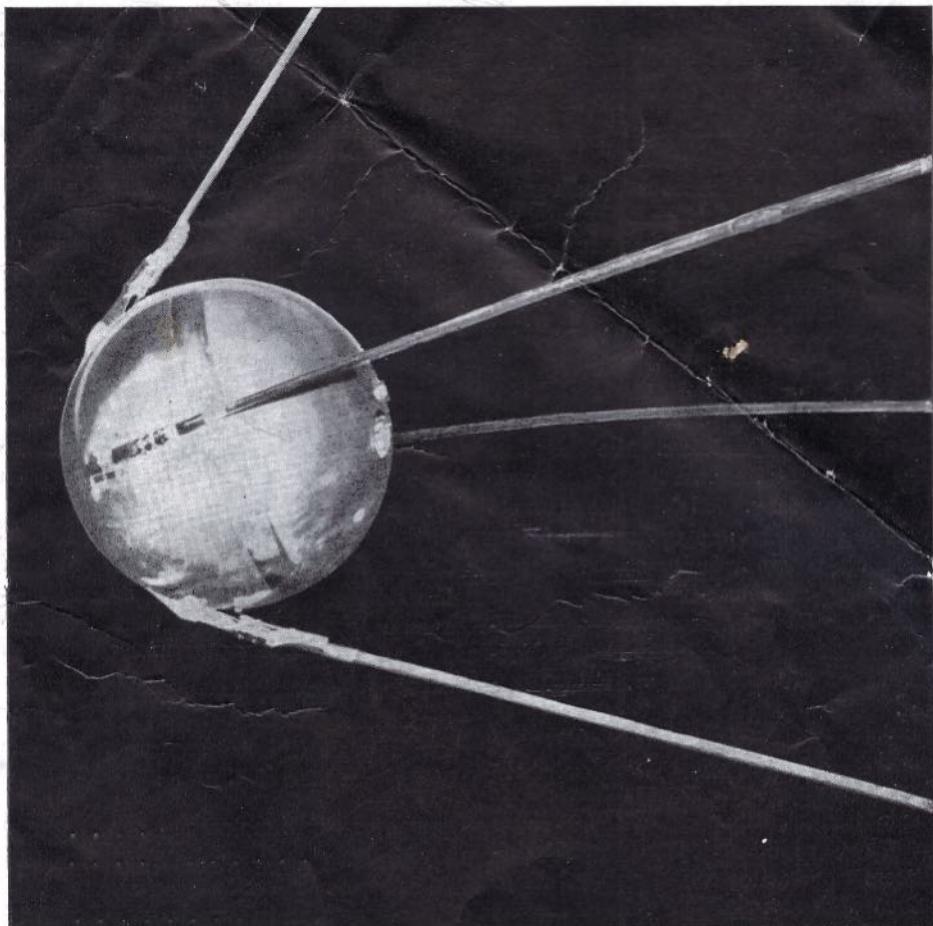




ACADEMY OF SCIENCES
OF THE USSR



FIRST SOVIET ARTIFICIAL
EARTH SATELLITE

ON OCTOBER 4, 1957, the Soviet Union successfully launched the first in the world artificial Earth satellite. This was a great event in the history of outer space exploration by man. The whole world applauded to Soviet scientists and engineers, glorifying their striking success.

The sputnik was placed in the fore part of a carrier rocket. When the sputnik was put into the orbit it was separated from the last stage of the carrier rocket by a special pusher. The protective nose cone which protected the sputnik from thermal and aerodynamic effect during the flight in dense atmosphere layers, was jettisoned simultaneously with the separation of the sputnik. After this the sputnik began independent flight in its orbit.

The spherical sputnik carried on its external surface 4 rodshaped antennae of radio transmitters. Two antennae were 2.4 metres long, and two other were 2.9 metres long. All the instruments and the power supply sources were housed in a hermetically sealed capsule made of aluminum-base alloys. The surface of the sputnik capsule was polished to provide it with the required absorption and radiation coefficient values.

A special thermoregulating system was installed for maintaining a sufficiently stable temperature conditions inside the satellite.

The sputnik carried two radio transmitters operating on frequencies of 20.005 and 40.002 mc (wave lengths 15 and 7.5 metres, respectively). The signals, emitted by the radio transmitters, were like telegraph messages with an average duration of 0.2 to 0.3 sec.

The radio transmitters, installed on the satellite, ensured the possibility of a systematic survey of its orbit. They also made it possible to study propagation of radio waves in ionosphere. The power of radiotransmitters was sufficient for the conventional amateur receivers for a reliable reception of radio-signals at a distance of up to 10–12 thousand kilometres. The power supply sources provided for the operation of all the instruments for three weeks.

The sputnik's orbit was an ellipse with one of the focuses in the centre of the Earth. The form and dimensions of the satellite's orbit gradually changed because of the braking of the sputnik in the upper layers of Earth's atmosphere. The different braking degrees of the satellite and of the carrier rocket was the reason that the time of their movement in their orbits was different.

The carrier rocket entered the dense atmosphere layers and burned up on December 1, 1957.

The first sputnik survived for 93 days and made 1400 revolutions around the Earth, then it entered dense atmosphere layers and ceased its existence on January 4, 1958.

The characteristics first artificial sputnik of the Earth and parameters of its orbit in the beginning of the flight are the following:

Diameter, millimetres	580
Weight, kg	83.6
Period of revolution around	
the Earth, min	96.17
Maximum altitude (apogee), km	947
Minimum altitude (perigee), km	226—228
Orbital inclination	65.1°